

REMARKS/ARGUMENTS

Claims 1-81 and 83-133 were pending before this amendment. Claims 1, 7-9, 18-19, 37, 109, 112-119, 121-130, and 132-133 have been amended. Claim 3 has been canceled. Thus, claims 1-2, 4-81 and 83-133 remain pending.

In summary of the Office Action of September 19, 2005, the Examiner has:

I. allowed claims 6, 14-17, 36, 38-54, and 66-81

II. rejected claims 1-13, 18-23, 37, 55-65, 83-91, 114, 116-121, and 125-133 under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,700,672 to Jones et al. (Jones) in view of US Patent No. 6,700,672 to Cook et al. (Cook).

III. rejected claims 92-108 under 35 U.S.C. 103(a) as being unpatentable over Jones in view of Cook and further in view of US Patent No. 6,577,312 to Deering et al. (Deering).

IV. rejected claims 109-111, and 122 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deering in view of Jones.

V. rejected claims 112, 113, 123, and 124 under 35 U.S.C. 103(a) as being unpatentable over Jones.

VI. rejected claim 115 under 35 U.S.C. 103(a) as being unpatentable over Cook.

The Applicants respectfully traverse the Examiner's rejections.

Examiner Interview

Applicants thanks the Examiner for the courtesy of the Interview conducted on May 16, 2005. Amendments to claim 1 and the cited references were discussed.

Examiner's response to Applicant's arguments

"Where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it."
MPEP § 707.07(f).

Applicant's respectfully point out that the current Office Action fails to respond to Applicant's arguments in amendment filed November 18, 2005 relating specifically to: (1) claims 9-13, 20-23, and 110-111; (2) claims 10-12; (3) claims 18-23 and 110; (4) claim 37; (5) claims 114 and 125; and (6) claims 120 and 131. For at least this reason, the rejection of these claims should be withdrawn.

I. Claims Allowed

Applicants earnestly thank the Examiner for indicating that claims 6, 14-17, 36, and 66-54 are allowed. *See* Office Action page 15. Applicants respectfully point out that the Office Action Summary sheet incorrectly states claims 66 and 67 are rejected.

Additionally, Applicants believe that claims 24-35 were erroneously left out of the listing of allowed claims.

Claims 24, 28, and 32 were previously indicated as being allowable, but objected to for being in dependent form. *See* Office Action of July 21, 2005, page 15. The response of November 18, 2005 submitted these claims in independent form. However, the current Office Action indicates on the Office Action Summary that the claims are rejected; however, the current Office Action does not describe a rejection for these claims. Accordingly, Applicants respectfully request withdrawal of this apparent rejection of claims 24, 28, and 32.

Claims 25-27, 29-31, 33-35, depend from claims 24, 28, and 32 respectively, and each includes all of the limitations of the claim from which it depends. Therefore, claims 25-27, 29-31, and 33-35 are also believed to be allowable, for at least the reasons stated above with regard to claims 24, 28, and 32.

II. 35 USC 103 rejection, Jones in view of Cook

Claims 1-13, 18-23, 37, 55-65, 83-91, 114, 116-121, and 125-133 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jones in view of Cook.

A. Claims 2-5, 55-65, and 83-108

1. A combination of Cook's pseudo-random rays and Jones's regular distribution of line samples does not teach or suggest non-regularly oriented line samples entirely within the image plane.

Claim 1 is allowable over Jones and Cook, either alone or in combination, as those references fail to disclose or suggest all the elements of claim 1. Claim 1 has been amended to highlight existing differences from the cited references. For example, claim 1 recites:

*wherein distributing includes:
projecting objects in the object scene onto an image plane; and
positioning the set of line samples on the image plane, wherein the
set of lines samples reside entirely within the image plane.*

The Office Action asserts that Cook's pseudo-randomly selecting a ray direction from one of a predetermined number of possible ray directions (Abstract) suggests a non-regular orientation for the line samples of Jones. *See* page 15 of Office Action. However, one skilled in the art would recognize that a line sample resides within the image plane while a ray travels from an object to the image plane.

As an illustration of these differences, a line sample is used, for example, to calculate a color value for a pixel from color values within the image plane. *See Specification*, page 38 lines 6-10 and Figures 8A-8E and 9B-9D of the present application. "Figure 8A and 8B-8E illustrate the projection of an object from an object scene onto an image plane." *Id.*, page 5. Thus, in Figure 8A, object 8010 is a two-dimensional image of the object in the image plane, much like Figure 1B shows the projection of object 120 onto image plane 110. As depicted in Figure 8A, line sample 8020 resides entirely within the image plane, and in this instance entirely within pixel 8000 of the image plane.

In Cook, a ray 89 traces light traveling from an object 103 to a point on the image plane. *See Cook*, Figure 18 and col. 10 lines 25-34. As seen in Figure 18, a ray only touches the image plane at one point, while the rest of the ray is outside of the image plane. In contrast, claim 1 recites that "the set of lines samples reside entirely within the image plane."

Accordingly, as a ray is different from a line sample, one would not combine these teachings of Jones and Cook, nor would their combination show the above limitations.

2. A combination of Cook's random point sampling and Jones's regular distribution of line samples does not teach or suggest a distribution of non-regular line sample orientations.

Claim 1 also recites: "*distributing a set of line samples, each having an orientation, across an object scene such that the distribution of the orientations of the set of line samples is non-regular.*"

The Office Action also seems to assert that Jones's regular distribution of a set of line samples (*See Jones*, col. 6, lines 45-59 and col. 8, lines 31-41) and Cook's pseudo-random point sampling (*See Cook*, col. 85, lines 52-54 and lines 64-68) combine to give a non-regular distribution of line sample orientations.

Prior Art

Jones is directed to a method for determining the weighted coverage value (WCV) that an object contributes to a pixel. Jones uses a uniform grid of sampling points in order to define pixels, which would be squares with the sampling points at the centers. *See Jones*, Figs. 11a-b. Jones also uses these sampling points in order to define its line samples. *See Jones*, Figs. 1a-e. The line sample is straight, centered on a sampling point. *See Jones*, col.3, lines 1-3. In Jones's examples of using multiple line samples for each sampling point, the line samples form a regular pattern where the lines are perpendicular to each other. *See Jones*, Figs. 7a-b and 10a-b.

Cook is directed to a method where "the object scene information in the computer database is sampled by points that are pseudo-randomly distributed in one or several functions or dimensions." *See Cook*, col. 1, lines 58-61.

Argument

Since both Jones and Cook use sample points, the pseudo-randomness of Cook would be used to alter the positions of Jones's sample points, and not the orientations of the line samples. Jones has one sample point centered in each square pixel where the vertical and horizontal lines intersect. *See Jones*, col. 6, lines 59-61. Even if the two perpendicular line samples taught by Jones were extended to many line samples, nothing in Jones suggests that the distribution of such line samples would be anything but a regular distribution of line samples separated by fixed angles. Randomly distributing these sample points per Cook would result in each sample point, and thus the intersection of the line samples, to reside randomly within each pixel. However, the orientations of the line samples would be in the regular distribution as defined in Jones. Thus, this combination of Jones and Cook does not disclose a distribution of the orientations of the set of line samples being non-regular, as recited in claim 1.

Jones also describes having one line per pixel, where the line is oriented to be perpendicular to an edge. *See Jones*, col. 8, lines 31-41. Because the pixels form a regular array, the resulting collection of line samples likely reflects a regular pattern. *See Jones*, Fig. 13, block 1304 (showing regularly spaced line samples along edges of a triangle). This pattern would be unaltered by any displacement of the center of the lines as the line samples would still have the same orientation of being perpendicular to the edge. Thus, the second method taught by Jones et al. also does not disclose or suggest the non-regular distribution of the orientations of the line samples as recited in claim 1.

For at least these reasons, claim 1 is allowable over the cited references. As claim 1 is allowable, dependent claims 2-5, 55-65, and 83-108 are also allowable for at least the same rationale.

B. Claims 7-13, 18-23, 37, 109-119, 121-130, and 132-133

Applicants submit that independent claims 7-9, 18-19, 37, 109, 112-119, 121-130, and 132-133 should be allowable for at least the same rationale as discussed with respect to claim 1. Claims 10-13 depend from claim 9; claims 20-23 depend from claim 19; and claims 110-111 depend from claim 109 and thus derive patentability at least therefrom.

C. Claim 9-13, 20-23, and 110-111

Claim 9 is allowable over Jones and Cook, either alone or in combination. Those references fail to disclose or suggest all the elements of claim 9, for at least two reasons. First, claim 9 recites: "*wherein the choosing step comprises: selecting a translation amount; and translating the line sample by reference to the translation amount."* The rejection contends that Jones's example illustrating why two perpendicular line samples should be used in order to get accurate color contributions from an object discloses translating the line sample. *See Jones*, col. 6 lines 36-50.

Here, Jones is concerned with a line sample being oriented parallel to an edge. Fig. 6a shows one example where the object does not cover the pixel or line sample, and thus the contribution to the color (WCV) of the pixel 603 from object 602 is 0. A WCV=0 is not desirable in this case, since the pixel 603 is close to object 602. Fig. 6b shows another example where the object 602 is completely covering the pixel and line sample, and thus the WCV is 1. WCV is not a translation amount, but a weighted coverage value that gives a percentage of contribution of an object to a pixel given the proximity of the pixel to an object's edge. *See Jones*, col. 2, lines 22-25. In Jones, the line sample and pixel remain in the same place in the image plane, and thus do not disclose a translation amount or translating the line sample by reference to the translation amount. Accordingly, claim 9 is allowable over the cited references.

Second, claim 9 is allowable for at least the same rationale as discussed with respect to claim 1.

As claim 9 is allowable, dependent claims 10-13 are also allowable for at least the same rationale. Applicants submit that claims 20, 110, and 111 should be allowable for at least the same rationale as discussed with respect to claim 9. As claim 20 is allowable, dependent claims 21-23 are allowable for at least the same rationale.

D. Claims 120 and 131

Claim 120 is allowable over Jones and Cook, either alone or in combination, as those references fail to disclose or suggest all the elements of claim 120. For example, claim 120 recites "*defining a plurality of substantially non-overlapping portions within said areas*;

assigning a line sample to a non-overlapping portion by reference to a non-regular sequence of numbers."

In Fig. 5 of Cook, the location of the sample point for each of the four areas is pseudo-randomly determined. *See Cook*, col. 5, lines 3-5. In contrast, claim 5 recites assigning a line sample to a different portion depending on a non-regular number. The non-regular number selects which portion the line sample resides, and not the location of the line sample within the selected portion. Accordingly, claim 120 is allowable over the cited references. Applicants submit that claim 131 should be allowable for at least the same rationale as discussed with respect to claim 120.

III. 35 USC 103 rejection, Jones in view of Cook and Deering

Claims 92-108

As claim 1 is allowable, claims 92-108 which depend therefrom are also allowable for at least the same rationale.

Deering is cited as teaching subdividing an object scent to form a grid. *See Office Action* page 12. This cited teaching of Deering does not make up for the deficiencies in Jones and Cook with respect to these claims.

IV. 35 USC 103 rejection, Deering in view of Jones

Claims 109-111, 122

Applicants note that the Cook reference appears to have been inadvertently omitted from the above rejection as this rejection uses the rejection of claim 1, which cites to Cook.

As the cited teaching of Deering does not make up for the deficiencies in Jones and Cook with respect to these claims, Applicants submit that claim 109 should be allowable for at least the same rationale as discussed with respect to claim 1. As claim 1 is allowable, claims 110-111 which depend therefrom are also allowable for at least the same rationale.

V. 35 USC 103 rejection, Jones

Claims 112, 113, 123, and 124

Claim 112 recites: “*distributing a set of line samples, each having an orientation, across an image plane such that the distribution of the orientations of the line samples is non-regular, wherein the line samples reside entirely within the image plane.*”

Claim 113 recites: “*distributing orientations of a set of line samples across the array of pixels in a non-regular pattern, wherein distributing includes: projecting objects in an object scene onto an image plane; and orienting the set of line samples on the image plane, wherein the set of line samples reside entirely within the image plane.*”

Claim 123 recites: “*instructions for distributing a set of line samples, each having an orientation, across an image plane such that the distribution of the orientations of the line samples is non-regular, wherein the line sample resides entirely within the image plane*”

Claim 124 recites: “*instructions for distributing orientations of a set of line samples across an array of pixels in a non-regular pattern, wherein the line samples reside entirely within the array of pixels.*”

For at least the reasons discussed with respect to claim 1, Jones fails to render as obvious these limitations. As such Applicants submit that claims 112, 113, 123, and 124 are patentable over Jones.

VI. 35 USC 103 rejection, Cook

Claim 115

Claim 115 recites: “*wherein a line sample is oriented within each pixel and distributed within the time period by reference to a non-regular sequence of numbers, wherein the line sample resides entirely within the video image frame.*”

For at least the reasons discussed with respect to claim 1, Cook fails to render as obvious these limitations. As such Applicants submit that claim 115 is patentable over Jones.

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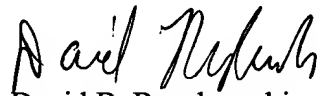
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CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance and an action to that end is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 415-576-0200.

Respectfully submitted,



David B. Raczkowski
Reg. No. 52,145

TOWNSEND and TOWNSEND and CREW LLP
Two Embarcadero Center, Eighth Floor
San Francisco, California 94111-3834
Tel: 415-576-0200
Fax: 415-576-0300
Attachments
DBR:db
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